A New Combination in *Deschampsia* (Poaceae) in Arctic North America[1]

Jorge Chiapella
Sistemática y filogeografía de plantas, IMBIV, CONICET–Universidad Nacional de Córdoba, Vélez Sarsfield 1611, X5016GCA Córdoba, Argentina.
Current address: Division of Systematic and Evolutionary Botany, Faculty of Life Sciences, University of Vienna, Rennweg 14, A-1030 Vienna, Austria. jchiapella@imbiv.unc.edu.ar

Abstract. Northern North American populations of *Deschampsia* P. Beauv. (Poaceae) present many taxonomic and nomenclatural problems resulting from: 1) morphologic clinal variation across the continent; and 2) overlap in taxonomic use of specific and/or infraspecific epithets that are also used in European or Russian plants. The new name *D. cespitosa* (L.) P. Beauv. subsp. *septentrionalis* Chiapella replaces the illegitimate combination *D. cespitosa* subsp. *brevifolia* (R. Br.) Tzvelev [≡ *D. brevifolia* R. Br.].

Key words: Alaska, Arctic, Canada, *Deschampsia*, Greenland, Poaceae.

Deschampsia (L.) P. Beauv. (Poaceae) is mainly a circumboreal grass genus, with some taxa scattered in the Southern Hemisphere. The most abundant species, *D. cespitosa* (L.) P. Beauv., is a polymorphic taxon, common in wet meadows of North America and Eurasia, with some isolated populations (probably introduced) in southern Argentina and Chile, Australia, South Africa, and New Zealand. The extensive range of this plant shows clearly the systematic and nomenclatural problems of a widespread taxon that has been studied separately in different regions of its distribution range. Regional variants of *D. cespitosa* have been treated either as separate species, although closely related ones, or as subspecies or varieties of a single species.

Treatments of *Deschampsia* in Alaska and Canada have recognized a variable number of taxa. For example, Porsild (1957) accepted *D. alpina* (L.) Roem. & Schult., *D. pumila* (Trin.) Ostenf., *D. brevifolia* R. Br., and *D. cespitosa*; Porsild and Cody (1968) added *D. mackenzieana* Raup to this group of four; McLachlan et al. (1989) listed *D. cespitosa*, *D. cespitosa* subsp. *brevifolia* (R. Br.) Tzvelev, *D. paramushirensis* Honda, *D. pumila*, and *D. glauca* Hartm. Hultén (1937, 1968) recognized the widespread *D. cespitosa*, *D. cespitosa* var. *glauca* (Hartm.) Sam., *D. cespitosa* subsp. *orientalis* Hultén, *D. brevifolia*, *D. pumila*, *D. beringensis* Hultén, *D. elongata* (Hook.) Munro, *D. danthonioides* (Trin.) Munro, and *D. flexuosa* (L.) Trin. [= *Avenella flexuosa* (L.) Drejer]. For the Canadian Arctic, Aiken et al. (2007) recognized *D. alpina*, *D. brevifolia*, and *D. sukatschewii* (Popl.) Roshev. subsp. *borealis* (Trautv.) Tzvelev. The more comprehensive treatment for North America by Barkworth (2007) recognized *D. alpina*, *D. brevifolia*, *D. cespitosa* (with two additional infraspecific taxa, *D. cespitosa* subsp. *beringensis* (Hultén) W. E. Lawr., and *D. cespitosa* subsp. *holciformis* (J. Presl) W. E. Lawr.), as well as *D. danthonioides*, *D. elongata*, *D. flexuosa*, *D. mackenzieana*, and *D. sukatschewii*.

A molecular and morphological study by Chiapella et al. (2011) included all specific and infraspecific taxa considered to be related and sympatric or parapatric to *Deschampsia cespitosa* s.l. in northern North America: *D. alpina*, *D. beringensis*, *D. brevifolia*, *D. cespitosa* subsp. *glauca* (Hartm.) C. Hartm., *D. mackenzieana*, *D. cespitosa* subsp. *orientalis*, and *D. pumila*. Other taxa growing in Canada (*D. danthonioides*, *D. elongata*) were not included because they were growing outside the studied region, and their delimitation was not problematic. The main results showed small differences in some key morphological characters, e.g., plant height, panicle length and width, length and width of leaves, ligule length, size and shape of glumes, lemmas and paleae, and length of the awns. There was no variation in DNA sequences; the whole evidence warranted the existence of distinguishable infraspecific taxa.

Two of the infraspecific taxa already have been treated as such (*Deschampsia cespitosa* subsp. *alpina* (L.) Tzvelev and *D. cespitosa* subsp. *beringensis*), and they were maintained at that rank. A third taxon has been treated either as a separate species, *D. brevifolia*, or as *D. cespitosa* subsp. *brevifolia*. The epithet *brevifolia* refers to small plants up to 15 cm high found in Arctic North America, i.e., Canadian

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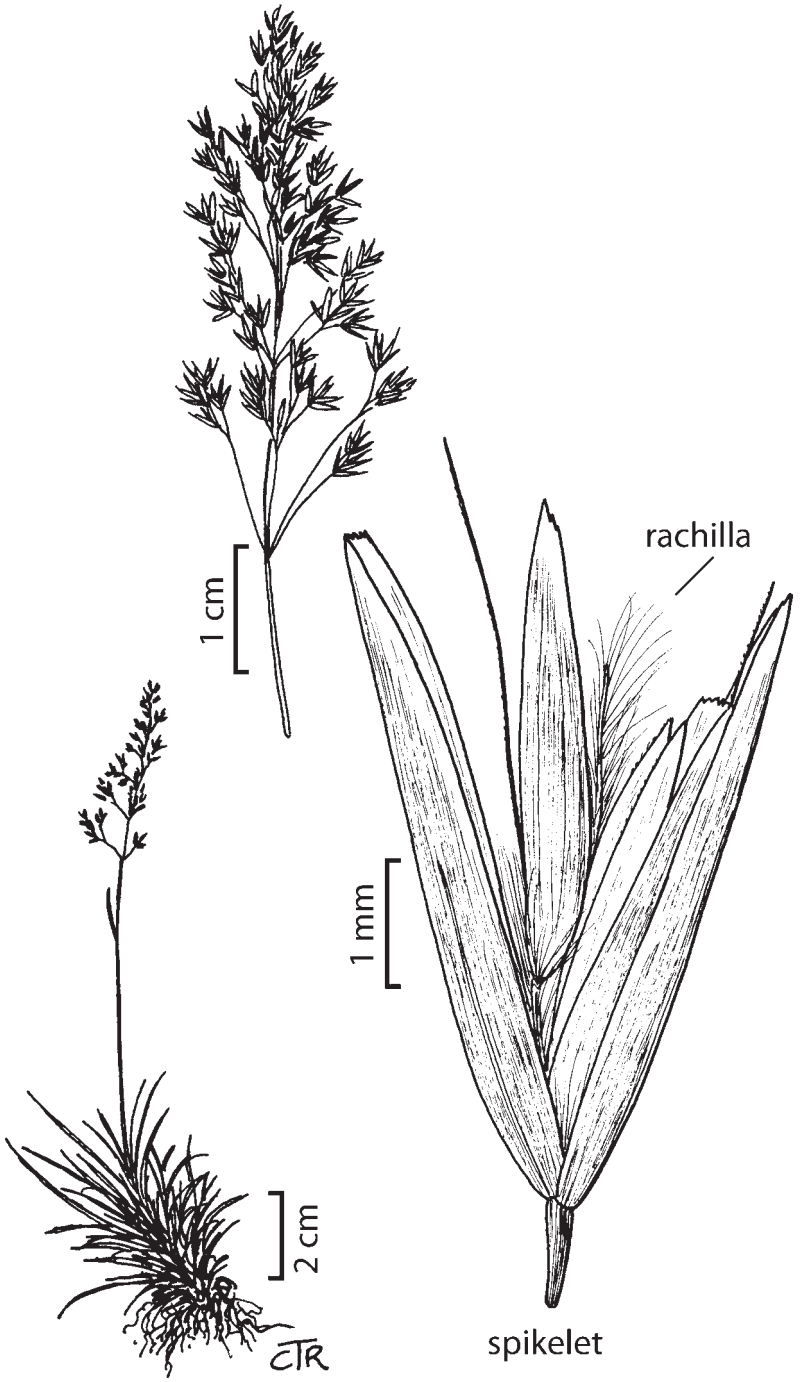

Figure 1. *Deschampsia cespitosa* (L.) P. Beauv. subsp. *septentrionalis* Chiapella. Habit, inflorescence, and spikelet. Illustration by Cindy Roché, copyright Utah State University, used with permission.

Arctic Archipelago (mostly Nunavut and the Northwest Territories), and adjacent Arctic mainland, coastal Yukon and the north coast of Alaska, and northern Greenland. It is worth noting that the name proposed by Brown (1823), *D. brevifolia* R. Br., is legitimate at specific level, but the combination *D. cespitosa* subsp. *brevifolia* (R. Br.) Tzvelev was published by Tzvelev in 1974, 122 years after

Grisebach (1852) coined *D. cespitosa* var. *brevifolia* Griseb. According to Article 53.4 (McNeill et al. 2012), "The names of two subdivisions of the same genus, or of two infraspecific taxa within the same species, even if they are of different rank, are homonyms if they are not based on the same type and have the same final epithet, or are treated as homonyms if they have a confusingly similar final epithet. The later name is illegitimate."

Deschampsia cespitosa subsp. *brevifolia* (R. Br.) Tzvelev is thus an illegitimate homonym, and since the taxon does not have the differentiation to be considered as a separate species, its name should be replaced in taxonomic usage. However, a different view has been proposed by Tsvelev and Probatova (2012), who considered a more restricted species concept.

Article 11.4 (McNeill et al., 2012) also supports the selection of a new name: "A name has no priority outside the rank in which it is published (but see Art. 53.4)."

In relation to the proposed new name, the epithet *septentrionalis* alludes to the northern distribution area of the plant. The new name agrees with Recommendation 24B of the Melbourne Code (McNeill et al., 2012): "Authors proposing new infraspecific names should avoid final epithets previously used as specific epithets in the same genus." The epithet *septentrionalis* has not been used in any combination in *Deschampsia*.

Deschampsia cespitosa (L.) P. Beauv., Ess. Agrostogr. 91, 149, 160, tab. 18, fig. 3. 1812. Basionym: *Aira cespitosa* L. TYPE: "Habitat in Europae partis cultis & fertilibus" (lectotype, designated by Clayton in Milne-Redhead & Polhill [1970: 92], Herb. Linn. No. 85.8, LINN).

Deschampsia cespitosa subsp. **septentrionalis** Chiapella, nom. nov. Basionym: *Deschampsia brevifolia* R. Br., Chlor. Melvill. 33(–34). 1823. Replaced synonym: *Deschampsia cespitosa* subsp. *brevifolia* (R. Br.) Tzvelev., Fl. Severo-Vostoka Evr. Casti SSSR 1: 141. 1974. TYPE: Canada. Melville Island, 1819–1820, W. E. Parry (K, holotype). Figure 1.

Deschampsia brevifolia R. Br. var. *major* Hook., Fl. Bor.-Amer. 2(12): 242. 1840. TYPE: not specified.

Deschampsia cespitosa var. *brevifolia* (M. Bieb.) Griseb., Fl. Ross. 4(13): 421. 1852. Basionym: *Aira brevifolia* M. Bieb., Fl. Taur.-Caucas. 3: 63. 1819. *Deschampsia cespitosa* var. *brevifolia* (M. Bieb.) Vasey ex Beal, Grasses N. 2: 369. 1896, nom. illeg. TYPE: [Asia minor.] "Habitat in herbidis circa Nartsana," (type not found).

Chromosome counts. $2n = 26$ (Bowden, 1960), $2n = 52$ (Petrovsky & Zhukova, 1981). The counts by Bowden (1960) and Petrovsky and Zhukova (1981) were done on plants identified as *Deschampsia brevifolia* R. Br., collected in Southampton Island (Canada) and Wrangel Island (Russian Federation), respectively. *Deschampsia cespitosa* has a complex cytology (Kawano, 1963, 1966; Röser et al., 2014), with proven different ploidy levels (Rothera & Davy, 1986). The counts in *D. cespitosa* subsp. *septentrionalis* hint at different ploidy levels in infraspecific taxa.

Dealing with intraspecific variation in *Deschampsia cespitosa* through its widespread distribution will require more studies using morphological, molecular, and cytological data.

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Literature Cited

Aiken, S. G., M. J. Dallwitz, L. L. Consaul, C. L. McJannet, R. L. Boles, G. W. Argus, J. M. Gillett, P. J. Scott, R. Elven, M. C. LeBlanc, L. J. Gillespie, A. K. Brysting, H. Solstad & J. G. Harris. 2007. Flora of the Canadian Arctic Archipelago: Descriptions, Illustrations, Identification, and Information Retrieval. NRC Research Press, National Research Council of Canada, Ottawa. <http://nature.ca/aaflora/data>, accessed 21 September 2015.

Barkworth, M. E. 2007. *Deschampsia*. Pp. 624–633 *in* M. E. Barkworth, K. M. Capels, S. Long & M. P. Piep (editors), Flora of North America: North of Mexico, Vol. 24. Magnoliophyta: Commelinidae (in part). Poaceae, Pt. 1. Oxford University Press, New York.

Bowden, W. M. 1960. Chromosome numbers and taxonomic notes on northern grasses: III. Twenty-five genera. Canad. J. Bot. 38(4): 541–557.

Brown, R. 1823. Chloris Melvilliana: A List of Plants Collected in Melville Island (Latitude 74-75 N., Longitude 110-112 W.) in the Year 1820; by the Officers of the Voyage of Discovery under the Orders of Captain Parry. W. Clowes, London.

Chiapella, J. O., V. L. DeBoer, G. C. Amico & J. C. Kuhl. 2011. A morphological and molecular study in the *Deschampsia cespitosa* complex (Poaceae; Poeae; Airinae) in northern North America. Amer. J. Bot. 98(8): 1366–1380.

Clayton, W. D. 1970. Gramineae. Pp. 1–176 *in* E. W. B. H. Milne-Redhead & Polhill, Flora of Tropical East Africa, Pt. 1. Crown Agents for Oversea Governments and Administrations, London.

Grisebach, A. H. R. 1852 [1853]. Gramineae. Pp. 324–484 *in* K. F. von Ledebour (editor), Flora Rossica, 4. Librariae E. Schweitzerbart, Stuttgart.

Hultén, E. 1937. Flora of the Aleutian Islands. Bokförs Aktienbolaget Thule, Stockholm.

Hultén, E. 1968. Flora of Alaska and Neighboring Territories: A Manual of the Vascular Plants. Stanford University Press, Stanford.

Kawano, S. 1963. Cytogeography and evolution of the *Deschampsia caespitosa* complex. Canad. J. Bot. 41(5): 719–742.

Kawano, S. 1966. Biosystematic studies of the *Deschampsia caespitosa* complex with special reference to the karyology of Icelandic populations. Bot. Mag. 79: 293–307.

McLachlan, K. I., S. G. Aiken, L. P. Lefkovitch & S. A. Edlund. 1989. Grasses of the Queen Elizabeth Islands. Canad. J. Bot. 67(7): 2088–2105.

McNeill, J., F. R. Barrie, W. R. Buck, V. Demoulin, W. Greuter, D. L. Hawksworth, P. S. Herendeen, S. Knapp, K. Marhold, J. Prado, W. F. Prud'homme van Reine, G. F. Smith, J. H. Wiersema & N. J. Turland. 2012. International Code of Nomenclature for Algae, Fungi, and Plants (Melbourne Code). Regnum Veg. 154.

Petrovsky, V. V. & P. G. Zhukova. 1981. Chromosome numbers and taxonomy of some plant species of Wrangel Island. Bot. Zhurn. 66(3): 380–387.

Porsild, A. E. 1957. Illustrated Flora of the Canadian Arctic Archipelago. Natl. Mus. Canada Bull. 146.

Porsild, A. E. & W. J. Cody. 1968. Checklist of the Vascular Plants of Continental Northwest Territories, Canada. Canada Department of Agriculture, Ottawa.

Röser, M., G. Winterfeld, E. Döring & J. Schneider. 2014. Chromosome evolution in grass tribes Aveneae/Poeae (Poaceae): Insights from karyotype structure and molecular phylogeny. Schlechtendalia 28: 1–21.

Rothera, S. L. & A. J. Davy. 1986. Polyploidy and habitat differentiation in *Deschampsia cespitosa*. New Phytol. 102(3): 449–467.

Tsvelev, N. N. & N. S. Probatova. 2012. The taxonomic revision of the genera *Deschampsia*, *Agrostis*, *Calamagrostis* (Poaceae - *Poeae*) and the system of grasses in the flora of Russia [in Russian]. Komarovskie Ctenija (Vladivostok) 59: 7–75.

Tzvelev, N. N. 1974. Flora Severo-Vostoka Evropeiskoi Chasti SSSR 1. Nauka, Leningrad.